

Claims

1. (Original) A chair system comprising:
a base with a height-adjustable support to which a chair portion can be coupled, the support having a rear side and a longitudinal axis;
a link arm having distal and proximal ends, the proximal end being pivotably connected to the support adjacent the rear side such that the link arm is pivotable to opposite sides of the longitudinal axis about a substantially vertical link arm pivot axis;
a primary support arm pivotably connected to the distal end of the link arm for pivoting relative to the link arm about a substantially vertical axis; and
a secondary support arm connected to the distal end of the link arm substantially along the vertical axis;
wherein the primary and secondary support arms are adapted to support weight and to be moved relative to each other and the link arm.
2. (Original) The chair system of claim 1, wherein the secondary support arm is constructed with an anti-interference feature to allow movement of the secondary support arm relative to the primary support arm to prevent interference between the support arms when the primary support arm is pivoted.
3. (Original) The chair system of claim 1, wherein the secondary support arm has an auxiliary pivot connection with a substantially horizontal pivot axis about which a portion of the secondary support can be vertically pivoted.
4. (Original) The chair system of claim 1, further comprising a manifold with conduit connections coupled to the link arm.
5. (Original) The chair system of claim 4, wherein the manifold is mounted to an upper surface of the link arm substantially along the vertical axis.
6. (Original) The chair system of claim 4, wherein the manifold is pivotable relative to the link arm.

7. (Original) The chair system of claim 1, further comprising a pivot bracket shaped to receive and pivotably support the proximal end of the link arm, the bracket being mounted to the rear side of the support.

8. (Original) The chair system of claim 1, wherein the primary support arm has an upright mast secured to and projecting upwardly from its distal end.

9. (Original) The chair system of claim 8, further comprising equipment pivotably mounted on the mast and selectively rotatable relative to the mast by the operator when the primary support arm is pivoted to an opposite side of the longitudinal axis.

10. (Original) The chair system of claim 9, wherein the mast defines a first equipment pivot axis, and wherein the pivotably mounted operator equipment defines a second equipment pivot axis spaced from the first equipment pivot axis for allowing an object coupled to the operator equipment to be pivoted.

11. (Original) The chair system of claim 8, further comprising a housing having a first end rotatably coupled to the mast and a second end rotatably supporting a cuspidor.

12. (Original) The chair system of claim 1, wherein the connection between the secondary arm and the link arm is a fixed connection.

13. (Original) The chair system of claim 1, wherein the connection between the secondary arm and the link arm is a pivotable connection allowing the secondary arm to be pivoted relative to the link arm.

14. (Original) The chair system of claim 1, wherein the secondary support arm is attached to an upper surface of the link arm and cantilevered above a plane of the primary support arm and the link arm.

15. (Original) The chair system of claim 1, wherein the secondary arm includes segments joined at a substantially vertical secondary arm pivot axis, the secondary arm pivot axis being positionable outside a radius defined by a length of the link arm.

16. (Original) The chair system of claim 1, wherein the secondary support arm is pivotable in a horizontal plane above the link arm and the primary support arm.

17. (Original) The chair system of claim 1, wherein the secondary support arm comprises at least a first segment and at least a second segment pivotably connected to the first segment for rotation in a generally horizontal plane.

18. (Original) The chair system of claim 17, further comprising at least a third segment pivotably connected to the second segment for rotation in a generally vertical plane.

19. (Original) The dental chair system of claim 18, wherein at least the third segment is equipped with a parallelogram supporting structure that provides a predetermined resistance to movement of the third segment.

20. (Original) The chair system of claim 1, wherein the link arm is swingable through an arc of at least about 180°, thereby allowing the link arm to be angled relative to the longitudinal axis on either side by at least about 90°.

21. (Original) The chair system of claim 1, wherein the link arm is swingable through an arc of at least 140°, thereby allowing the link arm to be angled relative to the longitudinal axis on either side by at least about 70°.

22. (Original) The chair system of claim 1, further comprising a chair portion coupled to the support, and wherein the link arm pivot axis intersects a back section of the chair portion when the chair portion is reclined.

23. (Original) The chair system of claim 1, wherein at least one of the link arm, the primary support arm and the secondary support arm has a substantially hollow construction.

24. (Original) The chair system of claim 1, wherein the secondary arm comprises multiple pivotably connected elongate segments capable of being positioned in space at a desired location and a tool holder mounted at a distal end thereof, the secondary arm being positionable to facilitate access to tools in the tool holder.

25. (Original) The chair system of claim 1, wherein at least the link arm and the primary arm have interior open areas through which conduits can be routed.

26. (Original) A dental chair system comprising:
a base having a height-adjustable support to which a dental chair portion may be coupled, the support having a rear side and a longitudinal axis;
an equipment arm pivotably coupled to the support to allow rotation about a substantially vertical pivot axis between opposite sides of the longitudinal axis, the equipment support arm comprising multiple segments joined to each other at pivotable connections; and
an auxiliary pivot connection joining two of the segments, the joined segments including, relative to the support, a proximal segment and a distal segment, the auxiliary pivot connection preventing the distal portion from rotating in a vertical plane below horizontal and allowing rotation above horizontal.

27. (Original) The dental chair system of claim 26, further comprising a manifold extending from an upper surface of the support arm, the manifold being positioned between the auxiliary pivot connection and the base.

28. (Original) The dental chair system of claim 26, further comprising a manifold rotatably mounted to the support arm.

29. (Original) The dental chair system of claim 26, wherein the support arm comprises an elongate generally lateral portion extending between the support and an inner side of the auxiliary pivot connection.

30. (Original) The dental chair system of claim 26, wherein the distal portion of the support arm includes a pivot connection with a substantially vertical pivot axis.

31. (Original) An arm assembly to adapt a dental chair for right-side or left-side use:
a compensating arm pivotably connected to a rear side of a support for the dental chair to pivot between left and right sides;

a primary arm pivotably connected to the compensating arm at a primary pivot axis to pivot in a generally horizontal plane; and

a secondary arm connected to the compensating arm near the primary pivot axis and having multiple segments, the secondary arm being vertically and horizontally movable relative to the primary arm and the compensating arm.

32. (Original) The arm assembly of claim 31, wherein a length of the compensating arm is set to position the primary pivot axis at a sufficient distance from the support to permit movement of the respective primary and secondary arms without interference.

33. (Original) The arm assembly of claim 31, wherein the secondary arm is positioned above the path of the primary arm.

34. (Original) An arm assembly for a dental chair comprising a single pivot connection positioned adjacent a head end of and below the patient supporting portion of the dental chair with a pivotably supported link arm, and at least two equipment arms connected to the link arm at points substantially aligned in a vertical direction, wherein at least one of the equipment arms is pivotably connected to the link arm.

35. (Original) An arm assembly for positioning equipment in a dental chair system, comprising:

a first element for pivotable attachment to a dental chair;
a second element pivotably attached to an end of the first element at a substantially vertical first pivot axis;
a third element attached to the second element substantially along the first pivot axis; and
a fourth element attached to the third element at a substantially vertical second pivot axis that is horizontally spaced from the first pivot axis.

36. (Currently amended) An arm assembly for a dental chair, comprising:
a link arm for pivotable connection to a rear of the dental chair allowing rotation in a substantially horizontal plane; and
a support arm connected to the link arm, the support arm having multiple pivotably connected elongate segments capable of being positioned in space at a desired location and a means for preventing interference ~~for preventing interference~~ between the support arm and other structure adjacent the dental chair.

37. (Currently amended) A multi-segmented arm assembly for a dental chair, comprising:
a link arm segment for pivotable attachment to a rear of the dental chair;
a first segment coupled to ~~a distal end of~~ the link arm segment;
a second segment pivotably connected to ~~a distal end of~~ the first segment at a substantially vertical pivot axis;
a third segment pivotably connected to ~~a distal end of~~ the second segment at a substantially horizontal pivot axis; and
a terminal segment pivotably connected to ~~a distal end of~~ the third segment.

38. (Original) The arm assembly of claim 37, further comprising a multi-function electronic control unit coupled to one of the segments, the control unit being having wiring extending through at least one of the segments.

39. (Original) The arm assembly of claim 38, wherein the electronic control unit is coupled to the terminal segment.

40. (Original) The arm assembly of claim 38, wherein the electronic control unit is rotatably coupled to the terminal segment.

41. (Original) The arm assembly of claim 37, further comprising at least one tool holder rotatably mounted to the terminal segment.

42. (Original) The arm assembly of claim 37, wherein at least one of the segments is configured to have a predetermined normal range of normal rotation about its respective pivot axis and to permit over-rotation beyond the predetermined normal range without damage to the at least one segment.

43. (Original) The arm assembly of claim 37, wherein the terminal segment is pivotably connected at a substantially horizontal pivot axis.

44. (Original) The arm assembly of claim 37, further comprising a parallelogram supporting structure for at least one segment.

45. (Original) The arm assembly of claim 37, further comprising a parallelogram supporting structure for at the third segment.

46. (Currently amended) A multi-segmented arm assembly for a dental chair, comprising:

- a link arm segment for pivotable attachment to a rear of the dental chair;
- a first segment coupled to ~~a distal end of~~ the link arm segment;
- a second segment pivotably connected to ~~a distal end of~~ the first segment at a substantially vertical pivot axis;
- a third segment pivotably connected to ~~a distal end of~~ the second segment at a substantially horizontal pivot axis;
- a fourth segment pivotably connected to ~~a distal end of~~ the third segment at a substantially horizontal pivot axis; and

a terminal segment pivotably connected to a ~~distal end of the fourth~~ segment.

47. (Original) The arm assembly of claim 46, further comprising a multi-function electronic control unit coupled to one of the segments, the control unit being having wiring extending through at least one of the segments.

48. (Original) The arm assembly of claim 47, wherein the electronic control unit is coupled to the terminal segment.

49. (Original) The arm assembly of claim 47, wherein the electronic control unit is rotatably coupled to the terminal segment.

50. (Original) The arm assembly of claim 46, further comprising at least one tool holder rotatably mounted to the terminal segment.

51. (Original) The arm assembly of claim 46, wherein at least one of the segments is configured to have a predetermined normal range of normal rotation about its respective pivot axis and to permit over-rotation beyond the predetermined normal range without damage to the at least one segment.

52. (Original) The arm assembly of claim 46, wherein the terminal segment is pivotably connected at a substantially horizontal pivot axis.

53. (Original) The arm assembly of claim 46, further comprising a parallelogram supporting structure for at least one segment.

54. (Original) The arm assembly of claim 46, further comprising a parallelogram supporting structure for at the third segment.

55. (Original) The arm assembly of claim 46, further comprising parallelogram support structures for at least the third and fourth segments.

56. (Original) A multi-segmented arm assembly for supporting equipment for use with patients, the arm assembly being pivotably connected to a rear of the dental chair and comprising at least five segments, each segment having at least one pivotable connection to at least one other segment, the segments and pivotable connections allowing the arm assembly to be raised, lowered and rotated to position a distal end of the arm end at desired positions relative to the rear of the dental chair.

57. (Original) A multi-segmented arm assembly for supporting dental equipment and having a modular construction, the arm assembly comprising:

a first portion having a proximal end and an opposite distal end, the first portion comprising at least first, second and third pivotably coupled segments, the second segment being coupled to the first segment at a substantially vertical pivot axis and the third segment being coupled to the second segment at a substantially horizontal pivot axis; and

a second portion comprising a terminal segment for connection to the distal end of the first portion.

58. (Original) The arm assembly of claim 57, wherein the first portion includes a fourth segment pivotably coupled to the third segment at a substantially horizontal pivot axis.

59. (Original) A chair system comprising:

a base with a height-adjustable support to which a chair portion can be coupled, the support having a rear side and a longitudinal axis;

a link arm having distal and proximal ends, the proximal end being pivotably connected to the support adjacent the rear side such that the link arm is pivotable between opposite sides of the longitudinal axis about a substantially vertical link arm pivot axis;

a support arm pivotably connected to the distal end of the link arm for pivoting relative to the link arm about a substantially vertical axis; and

an upright mast extending from the support arm, the upright mast defining an axis of rotation with respect to which at least one object can be rotatably mounted, the upright mast

allowing the object to be rotated relative to the mast as desired when the link arm and the support arm are repositioned.

60. (New) The arm assembly of claim 37, wherein the link arm segment has a distal end and the first segment is connected to the link arm segment at the distal end of the link arm segment.

61. (New) The arm assembly of claim 37, wherein the first segment has a distal end and the second segment is connected to the first segment at the distal end of the first segment.

62. (New) The arm assembly of claim 37, wherein the second segment has a distal end and the third segment is connected to the second segment at the distal end of the second segment.

63. (New) The arm assembly of claim 37, wherein the third segment has a distal end and the terminal segment is connected to the third segment at the distal end of the third segment.

64. (New) The arm assembly of claim 46, wherein the link arm segment has a distal end and the first segment is connected to the link arm segment at the distal end of the link arm segment.

65. (New) The arm assembly of claim 46, wherein the first segment has a distal end and the second segment is connected to the first segment at the distal end of the first segment.

65. (New) The arm assembly of claim 46, wherein the second segment has a distal end and the third segment is connected to the second segment at the distal end of the second segment.

66. (New) The arm assembly of claim 46, wherein the third segment has a distal end and the fourth segment is connected to the third segment at the distal end of the third segment.

67. (New) The arm assembly of claim 46, wherein the fourth segment has a distal end and the terminal segment is connected to the fourth segment at the distal end of the fourth segment.

68. (New) The arm assembly of claim 37, wherein at least the link arm segment, the second segment and the third segment have open interior areas in communication with each other through which conduits can be routed, the open interior areas of the link arm segment and the third segment being defined within closed cross-sections of the link arm segment and the third segment, respectively.

69. (New) The arm assembly of claim 46, wherein at least the link arm segment, the second segment and the third segment have open interior areas in communication with each other through which conduits can be routed, the open interior areas of the link arm segment and the third segment being defined within closed cross-sections of the link arm segment and the third segment, respectively.